

REMARKS

The Amendment and 35 U.S.C. § 112 rejection

Claim 22 is amended to correct an obvious error, addressing the new rejection under 35 U.S.C. § 112, second paragraph. The amendment does not narrow the scope of the claims. The above amendment materially reduces the issues for appeal since it removes the 35 U.S.C. § 112 rejection. The amendment does not raise new issues or present new matter. The amendment addresses the new 35 U.S.C. § 112 rejection and, thus, could not have been earlier presented. Accordingly, it is submitted that the requested amendment should be entered.

The Rejections under 35 U.S.C. § 103

The rejections of claims under 35 U.S.C. § 103, as being obvious over Andou (WO 97/36847 or U.S. Patent Nos. 6,190,576 or 6,319,570), alone, or in view of Pausch (U.S. Patent No. 6,027,665) or Leenhouts (U.S. Patent No. 5,883,686) are respectfully traversed.

It would appear that all three Andou references contain essentially the same disclosure since US '570 is a continuation of US '576 and both derive from the PCT application. Reference here will be made to the US '576 patent.

Andou provides a very broad generic disclosure of liquid crystalline compounds of the formula (I). The formula, without specificity, mentions as optional that the rings in the compound may be fluorinated. It is also optional, among other generically disclosed possibilities, to have a CF₂O or OCF₂ bridging group. Of the 217 subgeneric formulae recited in Andou at cols. 13-38, it appears that only one (Andou formulae (1-12)) encompasses the possibility of a compound having a 2,3-difluoro-substituted phenyl group on

the right side terminal and a cyclohexylene ring at the left side terminal linked by a CF₂O linking group. Compare applicants' formulae I-1, I-3 and I-4 in claim 1. Further, Andou discloses a long table depicting 691 compounds. It would appear that only two of these compounds fall within the (1-12) subgeneric formula of Andou, i.e., Compounds 379 and 380 at col. 171-172. Andou fails to disclose any composition which contains a compound meeting any of applicants' formulae I-1, I-3 or I-4 and at least one other liquid crystal component, such as applicants' component B - hence, at least part of the reason for withdrawal of the previous 35 U.S.C. § 102 rejection. Of the many compounds used in the 20 composition examples of Andou (cols. 231-250), only 9 compounds have a 2,3-difluorophenyl ring which is linked through a CF₂O group to a further ring structure; see Examples 45, 49, 52, 54, 57, 58, 60, 61 and Comparative 3 (none of these compounds have a OCF₂ bridging group). In every one of these nine compounds - in fact, they are all the same compound - the CF₂O group links to a phenyl ring on the left side of the structure which is then followed by a cyclohexyl further to the left of the phenyl. This is the "HB" part of the structure in the 5-HBCF₂OB(2F,3F)-O₂ terminology of Andou.

Applicants maintain their previous arguments that Andou fails to establish a *prima facie* case of obviousness against the instant claims and those arguments are repeated below. However, applicants also are providing herewith a Declaration under 37 C.F.R. § 1.132 providing comparative data to further show the nonobviousness of the claimed invention and overcome any *prima facie* case of obviousness. This is discussed first.

The Office Action points to the compounds 5-HBCF₂OB(2F,3F)-O₂ and 3-BCF₂OB(2F,3F)-O₂ as being the closest compounds of Andou specifically disclosed and alleges it would have been obvious to replace, in the compositions of Andou, a compound having the phenyl ring immediately to the left of the CF₂O group with the same compound

having a cyclohexyl group. The data in the declaration, as a whole, show that the positioning of the cyclohexyl group according to the instant claims leads to compositions with an unexpected advantage in terms of higher clearing point and broader nematic range. Thus, there is no interchangeability of the phenyl and cyclohexyl groups to achieve the same or similar properties.

In the Example A/Comparative Example A comparison, a composition according to Example 45 of Andou¹ was compared side-by-side with an identical composition wherein the 5-HBCF₂OB(2F,3F)-O₂ compound was replaced with 5-HCF₂OB(2F,3F)-O₂ so that the cyclohexyl is the first group to the left of the CF₂O bridge. This composition meets the instant claims with a compound of formula I-4. The resulting composition according to the claimed invention exhibited surprisingly advantageous results over the Andou composition in terms of significantly higher clearing point and a much lower crystallization temperature. Thus, the composition according to the claims had a much broader nematic phase range making it much more useful for liquid crystal applications according to the invention. See, e.g., page 3, lines 10-14, and page 27, lines 18-21, of the disclosure regarding this advantage.

Example B/Comparative Example B provides a similar showing between compositions which are identical except the example according to the invention has a compound with the cyclohexyl group directly to the left of the CF₂O group and the comparative example has the phenyl group left of the CF₂O group. As in Example A, the composition according to the invention has a significantly higher clearing point and much lower crystallization temperature. Again, demonstrating the advantage of the invention.

¹ As explained in the declaration, the corresponding propyl compound of Andou was used but this difference would not significantly effect the clearing point or nematic range as shown by Andou itself. It is further noted that the viscosity data given in Andou Example 45 is kinematic viscosity and not comparative to the rotational viscosity shown in the declaration.

Example C/Comparative Example C also provides a similar showing. Here, a compound in a composition according to the application is modified to replace the left-side cyclohexyl with phenyl (rather than change its position). The data again show that applicants' composition provides a significantly higher clearing point, advantageous for LC applications. It also shows that the phenyl and cyclohexyl groups are not interchangeable with an expectation of similar results.

The final comparison addresses the examples of the instant specification which are no longer within the claim scope. These examples were particularly referred to in the Office Action. Example 5 of the specification (not within the instant claims) resulted in a composition with a clearing point of 70.5 °C. The composition was remade with the CPQIY compounds replaced by a CQPY compound meeting formula I-4 of claim 1. Consistent with the above comparisons, the composition according to the instant claims demonstrated a significantly higher clearing point.

The above data clearly and convincingly – and across several embodiments – demonstrate that applicants' compositions containing a compound having a cyclohexyl group directly left of the CF₂O bridging group have advantageous LC properties over the closest comparisons of Andou. These advantages certainly could not have been expected by Andou. Thus, the unexpected advantages provide evidence of the nonobviousness of claimed invention, despite the broad generic disclosure of Andou.

In addition, Andou fails to establish a *prima facie* case of obviousness for the following reasons. As established, Andou provides no specific embodiment or specific evidence to suggest that the reference inventors were in possession of a composition meeting the recitations of the instant claims. Andou provides a very broad generic formula encompassing 217 recited subgeneric formula recited by Andou and countless actual

compounds. Andou's disclosure, in a very broad generic sense, encompasses the compositions of applicants' claim 1. However, applicants' claims make up only a very small portion of that broad generic disclosure, as evidenced by the fact that only one of the 217 subgeneric formulae of Andou overlaps with a minor portion of some of the compounds used in applicants' compositions and that only one of the 691 compounds listed by Andou is a compound used in applicants' compositions.

Applicants' urge that Andou's broad disclosure does not render obvious applicants' invention. In re Jones, 21 USPQ 2d 1941 (Fed. Cir. 1992), made clear that it is not correct that "... regardless of how broad, a disclosure of a chemical genus renders obvious any species which happens to fall within it." Instead, the disclosure must be considered as a whole as to whether it fairly suggests the claimed invention to one of ordinary skill in the art. Further, see In re Baird, 29 USPQ2d 1550 (Fed. Cir. 1994), whose facts are quite similar to the case at hand. In Baird the claim in question was directed to a composition of a biphenol A polyester with an aliphatic carboxylic acid. The reference disclosed the polymeric esterification product of a dicarboxylic acid and a diphenol of a certain generic formula. The generic formula contained several variables each having a range of possibilities such that the generic formula encompassed a very large number of compounds, i.e. allegedly about 100 million, one of which was bisphenol A. There was nothing in the reference to suggest the specific selection of variables necessary to arrive at bisphenol A and the Court stated that the reference actually indicated a preference for compounds distinct from bisphenol A. Therefore, the Court concluded that the reference did not fairly suggest the ester from bisphenol A and, thus, did not render the claimed invention prima facie obvious.

As in Baird, here the generic formula of Andou encompasses a countless number of compounds and the relevant compounds of applicants' compositions overlap only a very

small portion of Andou's scope. Further, contrary to Andou directing one of ordinary skill in the art towards compositions containing compounds meeting applicants' claim 1, all of the Andou compositions which contain CF_2O or OCF_2 bridged compounds contain them in a manner not meeting applicants' claim 1, i.e., they always contain a phenylene group on the direct left hand side of the bridging group. Thus, as in Baird, the examples direct away from, rather than toward applicants' compositions. In such circumstance, it is urged that Andou fails to fairly suggest the claimed invention to one of ordinary skill in the art, despite its generic disclosure.

Certain dependent claims are even further removed from the Andou disclosure. For example, the compositions of claims 10 and 22, containing a compound wherein Z^{12} is OCF_2 , in addition to being remote from Andou's broad generic disclosure, are also not even within the above-discussed single subgeneric formula (I-12) of Andou or within Andou's formula 379 or 380. Thus, the remoteness of Andou from fairly suggesting such claims is even more clear.


The additional rejections of dependent claims further in view of Pausch or Leenhouts will fall if the rejection over Andou is overcome, as discussed above. These secondary references do not provide teachings related to the distinction of Andou made above. Thus, if the rejection over Andou alone is overcome, these rejections are as well. Separate argument on these dependent claims and these rejections will, thus, be reserved.

Considering the evidence as a whole, including the comparative data in the declaration and the broad and remote nature of Andou's generic teachings, it is urged that the claimed invention is not rendered obvious to one of ordinary skill in the art by the cited prior art. Thus, the several rejections under 35 U.S.C. § 103 should be withdrawn.

It is submitted that the application is in condition for allowance. But the Examiner is kindly invited to contact the undersigned to discuss any unresolved matters.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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